

- 1 - IAP10 Resubmitted 06 DEC 2005

## SEQUENCE LISTING

5 <110> xantos biomedicine AG

10 <120> A new angiogenic factor and its medical use

<130> X62815PC

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20 <151> 2003-06-10

<150> US 60/503,388

25 <151> 2003-09-16

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	tccaggcatg ctgggcaaca gggaccccat ctctacaaaa aagtttaaaa aattagccag	3060
	gcgtggtggt gcacctgtcg tcttagctac ttgggagggt gaggtgggag gatcacttga	3120
35	gccagaagc ttgaagctgc agtgagctag gatcggtcca ctgcactcca acctgggtga	3180
	gagagcgaga ccctgtctca agaaaaagaa aaatgcagag aaacaggagt cttggctact	3240
40	cctttagagg cagactcaga ccctcctgcc tcacagcttt atctttgtat ttgcccctta	3300
	ctttatcttg tgccttgaga aattgctggg gagagaggta tgtccactgg gcagctgtac	3360
	aggatggagg atatagggcg tttccactcc cagcagccag gttccctcac cccaagctca	3420
45	cccactgttg gggagattat ctacaataac accagaaaca cattgggggt gattgggggt	3480
	atccttatgg gttcttttca gggaaccatt gctggacaag gcacaggagc cacctccatt	3540
50	tctgagctct gcaagggaca agaactagag ccatcagggg ctgggctcac tgtggcccca	3600
	ccccaagccg tcagcctcca gggatctaca ccctgccttg gctgctacag ctttttact	3660
	ccactgccct aggggagttc agcaacctaa tgatctctat ctctgaacat ctcttcatcc	3720
55	catgctccaa gtccagcaac ctgcacctg gaaccaggag tggaccctac ccgagctgtc	3780
	tgtattaatc cccatcccc accaccaatc ttaaaaagcc ctctgtcccc ctaccctaaa	3840
60	cccagttag gtacccatgc tgggcaggtc agttaacaat ttatgcacag gtactagttt	3900
	tattgtatta ccgttcagg gtagcttga aaaaagtatc tcaaaaaggc aacatgggcc	3960

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gagcgcagtg gctcacgcct gtaatcccag cactttggga ggccaagggtg ggcagatcgc 4020  
 ctgagggtctg gagttcaaga ccagcctggc caacagggtg aaaccccgtc tctacaaaaa 4080  
 5 taagaaaatt agccagggtgt agtggcagac gtctgtaatc ccagctattc aggaggctga 4140  
 ggcacgagaa ttccatgaac ccaggatgcg gaggttgtag tgagccgaga ttgtgccact 4200  
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 Cys Leu Thr Ala Arg Asp Gln Asp Arg Leu Arg Ala Thr Cys Thr Leu  
 35 35 40 45  
  
 Ser Gly Asn Arg Asp Thr Leu Trp His Leu Phe Asn Thr Leu Gln Arg  
 50 55 60  
  
 40 Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
 65 70 75 80  
  
 Leu Val Asp Leu Ala Asp Glu Val Ala Ser Val Tyr Gln Ser Tyr Gln  
 45 85 90 95  
  
 Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 50 100 105 110  
  
 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
  
 55 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val  
 130 135 140  
  
 60 Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
 145 150 155 160

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Leu Gln Thr Leu Ser Pro Arg Ala Ile Pro Arg Asn Pro Asp Gly Gly  
 165 170 175

5 Pro Leu Glu Ser Ser Ser Asp Leu Ala Ala Leu Ser Pro Leu Thr Ser  
 180 185 190

10 Ser Gly His Gln Glu Gln Asp Thr Glu Leu Gly Ser Thr His Thr Ala  
 195 200 205

15 Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly Pro Val Ser Pro Ser  
 210 215 220

20 Val Ser Phe Gln Pro Leu Ala Arg Ser Thr Pro Arg Ala Ser Arg Leu  
 225 230 235 240

25 Pro Gly Pro Thr Gly Ser Val Val Ser Thr Gly Thr Ser Phe Ser Ser  
 245 250 255

30 Ser Ser Pro Gly Leu Ala Ser Ala Gly Ala Ala Glu Gly Lys Gln Gly  
 260 265 270

35 Ala Glu Ser Asp Gln Ala Glu Pro Ile Ile Cys Ser Ser Gly Ala Glu  
 275 280 285

40 Ala Pro Ala Asn Ser Leu Pro Ser Lys Val Pro Thr Thr Leu Met Pro  
 290 295 300

45 Val Asn Thr Val Ala Leu Lys Val Pro Ala Asn Pro Ala Ser Val Ser  
 305 310 315 320

50 Thr Val Pro Ser Lys Leu Pro Thr Ser Ser Lys Pro Pro Gly Ala Val  
 325 330 335

55 Pro Ser Asn Ala Leu Thr Asn Pro Ala Pro Ser Lys Leu Pro Ile Asn  
 340 345 350

60 Ser Thr Arg Ala Gly Met Val Pro Ser Lys Val Pro Thr Ser Met Val  
 355 360 365

65 Leu Thr Lys Val Ser Ala Ser Thr Val Pro Thr Asp Gly Ser Ser Arg  
 370 375 380

70 Asn Glu Glu Thr Pro Ala Ala Pro Thr Pro Ala Gly Ala Thr Gly Gly  
 385 390 395 400

75 Ser Ser Ala Trp Leu Asp Ser Ser Ser Glu Asn Arg Gly Leu Gly Ser  
 405 410 415

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	Glu	Leu	Ser	Lys	Pro	Gly	Val	Leu	Ala	Ser	Gln	Val	Asp	Ser	Pro	Phe	
				420					425							430	
5																	
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			435					440					445				
10																	
	Met	Gly	Pro	Cys	His	Gly	Pro	Glu	Glu	Asn	Glu	Tyr	Lys	Ser	Glu	Gly	
		450					455					460					
15																	
	Thr	Phe	Gly	Ile	His	Val	Ala	Glu	Asn	Pro	Ser	Ile	Gln	Leu	Leu	Glu	
	465					470					475					480	
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	Ala	Asp	Arg	Lys	Phe	Gln	Glu	Arg	Glu	Val	Pro	Cys	His	Arg	Pro	Ser	
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	Pro	Gly	Ala	Leu	Trp	Leu	Gln	Val	Ala	Val	Thr	Gly	Val	Leu	Val	Val	
			515					520					525				
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	<213>	artificial sequence															
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	<223>	fragment															
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55																	
	Ser	Asn	Phe	Cys	Asn	Val	Asp	Val	Val	Glu	Ile	Leu	Pro	Tyr	Leu	Pro	
				20					25					30			
60																	
	Cys	Leu	Thr	Ala	Arg	Asp	Gln	Asp	Arg	Leu	Arg	Ala	Thr	Cys	Thr	Leu	
			35														

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5 Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
 65 70 75 80  
 Leu Val Asp Leu Ala Asp Glu Val Ala Ser Val Tyr Glu Ser Tyr Gln  
 85 90 95  
 10 Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 100 105 110  
 15 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
 20 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val  
 130 135 140  
 25 Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
 145 150 155 160  
 Leu Gln Thr Leu Ser Pro Arg Ala Ile Pro Arg Asn Pro Asp Gly Gly  
 165 170 175  
 30 Pro Leu Glu Ser Ser Ser Asp Leu Ala Ala Leu Ser Pro Leu Thr Ser  
 180 185 190  
 35 Ser Gly His Gln Glu Lys Asp Thr Glu Leu Gly Ser Thr His Thr Ala  
 195 200 205  
 40 Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly Pro Val Ser Pro Ser  
 210 215 220  
 45 Val Ser Phe Gln Pro Leu Ala Arg Ser Thr Pro Arg Ala Ser Arg Leu  
 225 230 235 240  
 Pro Gly Pro Thr Gly Ser Val Val Ser Thr Gly Thr Ser Phe Ser Ser  
 245 250 255  
 50 Ser Ser Pro Gly Leu Ala Ser Ala Gly Ala Ala Glu Gly Lys Gln Gly  
 260 265 270  
 55 Ala Glu Ser Asp Gln Ala Pro Ile Ile Cys Ser Ser Gly Ala Glu Ala  
 275 280 285  
 60 Pro Ala Asn Ser Leu Pro Ser Lys Val Pro Thr Thr Leu Met Pro Val  
 290 295 300  
 Asn Thr Val Ala Leu Lys Val Pro Ala Asn Pro Ala Ser Val Ser Thr

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[illegible]



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&lt;223&gt; Fragment

&lt;400&gt; 8

5 Met Pro Phe Ala Glu Asp Lys Thr Tyr Lys Tyr Ile Cys Arg Asn Phe  
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 10 Ser Asn Phe Cys Asn Val Asp Val Val Glu Ile Leu Pro Tyr Leu Pro  
 20 25 30  
 15 Cys Leu Thr Ala Arg Asp Gln Asp Arg Leu Arg Ala Thr Cys Thr Leu  
 35 40 45  
 20 Ser Gly Asn Arg Asp Thr Leu Trp His Leu Phe Asn Thr Leu Gln Arg  
 50 55 60  
 25 Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
 65 70 75 80  
 30 Leu Val Asp Leu Ala Asp Glu Val Ala Ser Val Tyr Glu Ser Tyr Gln  
 85 90 95  
 35 Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 100 105 110  
 40 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
 45 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val  
 130 135 140  
 50 Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
 145 150 155 160  
 55 Leu Gln Thr Leu Ser Pro Arg Ala Ile Pro Arg Asn Pro Asp Gly Gly  
 165 170 175  
 60 Pro Leu Glu Ser Ser Ser Asp Leu Ala Ala Leu Ser Pro Leu Thr Ser  
 180 185 190  
 65 Ser Gly His Gln Glu Lys Asp Thr Glu Leu Gly Ser Thr His Thr Ala  
 195 200 205  
 70 Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly Pro Val Ser Pro Ser  
 210 215 220  
 75 Val Ser Phe Gln Pro Leu Ala Arg Ser Thr Pro Arg Ala Ser Arg  
 225 230 235

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 20 25 30  
 25 Cys Leu Thr Ala Arg Asp Gln Asp Arg Leu Arg Ala Thr Cys Thr Leu  
 35 40 45  
 30 Ser Gly Asn Arg Asp Thr Leu Trp His Leu Phe Asn Thr Leu Gln Arg  
 50 55 60  
 35 Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
 65 70 75 80  
 Leu Val Asp Leu Ala Asp Glu Val Ala Ser Val Tyr Glu Ser Tyr Gln  
 85 90 95  
 40 Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 100 105 110  
 45 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
 50 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val  
 130 135 140  
 55 Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
 145 150 155 160  
 Leu Gln Thr Leu Ser Pro Arg Ala Ile Pro Arg Asn Pro Asp Gly Gly  
 165 170 175  
 60 Pro Leu Glu Ser Ser Ser Asp Leu Ala Ala Leu Ser Pro Leu Thr Ser  
 180 185 190

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5 Ser Gly His Gln Glu Lys Asp Thr Glu Leu Gly Ser Thr His Thr Ala  
 195 200 205  
 Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly Pro Val Ser Pro Ser  
 210 215 220  
 10 Val Ser Phe Gln Pro Leu Ala Arg Ser Thr Pro Arg  
 225 230 235  
 15 <210> 10  
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 20 <213> artificial sequence  
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 <400> 10  
 30 Met Pro Phe Ala Glu Asp Lys Thr Tyr Lys Tyr Ile Cys Arg Asn Phe  
 1 5 10 15  
 35 Ser Asn Phe Cys Asn Val Asp Val Val Glu Ile Leu Pro Tyr Leu Pro  
 20 25 30  
 40 Cys Leu Thr Ala Arg Asp Gln Asp Arg Leu Arg Ala Thr Cys Thr Leu  
 35 40 45  
 45 Ser Gly Asn Arg Asp Thr Leu Trp His Leu Phe Asn Thr Leu Gln Arg  
 50 55 60  
 Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
 65 70 75 80  
 50 Leu Val Asp Leu Ala Asp Glu Val Ala Ser Val Tyr Glu Ser Tyr Gln  
 85 90 95  
 55 Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 100 105 110  
 60 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val

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130                      135                      140  
 5    Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
      145                      150                      155                      160  
      Leu Gln Thr Leu Ser Pro Arg Ala Ile Pro Arg Asn Pro Asp Gly Gly  
 10                      165                      170                      175  
      Pro Leu Glu Ser Ser Ser Asp Leu Ala Ala Leu Ser Pro Leu Thr Ser  
                     180                      185                      190  
 15    Ser Gly His Gln Glu Lys Asp Thr Glu Leu Gly Ser Thr His Thr Ala  
                     195                      200                      205  
 20    Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly Pro Val Ser Pro Ser  
                     210                      215                      220  
 25    Val Ser Phe Gln Pro Leu Ala Arg  
      225                      230  
      <210> 11  
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      <212> PRT  
      <213> artificial sequence  
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      <220>  
 40    <223> Fragment  
      <400> 11  
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      Ser Asn Phe Cys Asn Val Asp Val Val Glu Ile Leu Pro Tyr Leu Pro  
 50                      20                      25                      30  
      Cys Leu Thr Ala Arg Asp Gln Asp Arg Leu Arg Ala Thr Cys Thr Leu  
                     35                      40                      45  
 55    Ser Gly Asn Arg Asp Thr Leu Trp His Leu Phe Asn Thr Leu Gln Arg  
      50                      55                      60  
 60    Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
      65                      70                      75                      80

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	Leu	Val	Asp	Leu	Ala	Asp	Glu	Val	Ala	Ser	Val	Tyr	Glu	Ser	Tyr	Gln	
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5	Pro	Arg	Thr	Ser	Asp	Arg	Pro	Pro	Asp	Pro	Leu	Glu	Pro	Pro	Ser	Leu	
				100					105					110			
10	Pro	Ala	Glu	Arg	Pro	Gly	Pro	Pro	Thr	Pro	Ala	Ala	Ala	His	Ser	Ile	
			115					120					125				
15	Pro	Tyr	Asn	Ser	Cys	Arg	Glu	Lys	Glu	Pro	Ser	Tyr	Pro	Met	Pro	Val	
		130					135					140					
20	Gln	Glu	Thr	Gln	Ala	Pro	Glu	Ser	Pro	Gly	Glu	Asn	Ser	Glu	Gln	Ala	
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25	Leu	Gln	Thr	Leu	Ser	Pro	Arg	Ala	Ile	Pro	Arg						
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	1				5					10					15		
45	Ser	Asn	Phe	Cys	Asn	Val	Asp	Val	Val	Glu	Ile	Leu	Pro	Tyr	Leu	Pro	
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50	Cys	Leu	Thr	Ala	Arg	Asp	Gln	Asp	Arg	Leu	Arg	Ala	Thr	Cys	Thr	Leu	
			35					40					45				
55	Ser	Gly	Asn	Arg	Asp	Thr	Leu	Trp	His	Leu	Phe	Asn	Thr	Leu	Gln	Arg	
		50					55					60					
60	Arg	Pro	Gly	Trp	Val	Glu	Tyr	Phe	Ile	Ala	Ala	Leu	Arg	Gly	Cys	Glu	
	65					70					75					80	
	Leu	Val	Asp	Leu	Ala	Asp	Glu	Val	Ala	Ser	Val	Tyr	Glu	Ser	Tyr	Gln	
					85					90						95	

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Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 100 105 110  
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 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
 10 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val  
 130 135 140  
 15 Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
 145 150 155 160  
 Leu Gln Thr Leu Ser Pro Arg  
 165  
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 <211> 341  
 25 <212> PRT  
 <213> artificial sequence  
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 40 Leu Ala Ala Leu Ser Pro Leu Thr Ser Ser Gly His Gln Glu Lys Asp  
 20 25 30  
 45 Thr Glu Leu Gly Ser Thr His Thr Ala Gly Ala Thr Ser Ser Leu Thr  
 35 40 45  
 50 Pro Ser Arg Gly Pro Val Ser Pro Ser Val Ser Phe Gln Pro Leu Ala  
 50 55 60  
 55 Arg Ser Thr Pro Arg Ala Ser Arg Leu Pro Gly Pro Thr Gly Ser Val  
 65 70 75 80  
 Val Ser Thr Gly Thr Ser Phe Ser Ser Ser Ser Pro Gly Leu Ala Ser  
 85 90 95  
 60 Ala Gly Ala Ala Glu Gly Lys Gln Gly Ala Glu Ser Asp Gln Ala Pro  
 100 105 110

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5      Ile Ile Cys Ser Ser Gly Ala Glu Ala Pro Ala Asn Ser Leu Pro Ser  
               115                                  120                                  125

10      Lys Val Pro Thr Thr Leu Met Pro Val Asn Thr Val Ala Leu Lys Val  
               130                                  135                                  140

15      Pro Ala Asn Pro Ala Ser Val Ser Thr Val Pro Ser Lys Leu Pro Thr  
               145                                  150                                  155                                  160

20      Ser Ser Lys Pro Pro Gly Ala Val Pro Asn Ala Leu Thr Asn Pro Ala  
                                   165                                  170                                  175

25      Pro Ser Lys Leu Pro Ile Asn Ser Thr Arg Ala Gly Met Val Pro Ser  
                                   180                                  185                                  190

30      Lys Val Pro Thr Ser Met Val Leu Thr Lys Val Ser Ala Ser Thr Val  
                                   195                                  200                                  205

35      Pro Thr Asp Gly Ser Ser Arg Asn Glu Glu Thr Pro Ala Ala Pro Thr  
               210                                  215                                  220

40      Pro Ala Gly Ala Thr Gly Gly Ser Ser Ala Trp Leu Asp Ser Ser Phe  
               225                                  230                                  235                                  240

45      Glu Asn Arg Gly Leu Gly Ser Glu Leu Ser Lys Pro Gly Val Leu Ala  
                                   245                                  250                                  255

50      Ser Gln Val Asp Ser Pro Phe Ser Gly Cys Phe Glu Asp Leu Ala Ile  
                                   260                                  265                                  270

55      Ser Ala Ser Thr Ser Leu Gly Met Gly Pro Cys His Gly Pro Glu Glu  
                                   275                                  280                                  285

60      Asn Glu Tyr Lys Ser Glu Gly Thr Phe Gly Ile His Val Ala Glu Asn  
               290                                  295                                  300

65      Pro Ser Ile Gln Leu Leu Glu Gly Asn Pro Gly Pro Pro Ala Asp Pro  
               305                                  310                                  315                                  320

70      Asp Gly Gly Pro Arg Pro Gln Ala Asp Arg Lys Phe Gln Glu Arg Glu  
                                   325                                  330                                  335

75      Val Pro Cys His Arg  
                                   340

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 15 <400> 14  
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 20 Ser Pro Leu Thr Ser Ser Gly His Gln Glu Lys Asp Thr Glu Leu Gly  
 20 25 30  
 25 Ser Thr His Thr Ala Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly  
 35 40 45  
 30 Pro Val Ser Pro Ser Val Ser Phe Gln Pro Leu Ala Arg Ser Thr Pro  
 50 55 60  
 35 Arg Ala Ser Arg Leu Pro Gly Pro Thr Gly Ser Val Val Ser Thr Gly  
 65 70 75 80  
 40 Thr Ser Phe Ser Ser Ser Ser Pro Gly Leu Ala Ser Ala Gly Ala Ala  
 85 90 95  
 45 Glu Gly Lys Gln Gly Ala Glu Ser Asp Gln Ala Pro Ile Ile Cys Ser  
 100 105 110  
 50 Ser Gly Ala Glu Ala Pro Ala Asn Ser Leu Pro Ser Lys Val Pro Thr  
 115 120 125  
 55 Thr Leu Met Pro Val Asn Thr Val Ala Leu Lys Val Pro Ala Asn Pro  
 130 135 140  
 60 Ala Ser Val Ser Thr Val Pro Ser Lys Leu Pro Thr Ser Ser Lys Pro  
 145 150 155 160  
 Pro Gly Ala Val Pro Asn Ala Leu Thr Asn Pro Ala Pro Ser Lys Leu  
 165 170 175  
 65 Pro Ile Asn Ser Thr Arg Ala Gly Met Val Pro Ser Lys Val Pro Thr  
 180 185 190



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Ser Met Val Leu Thr Lys Val Ser Ala Ser Thr Val Pro Thr Asp Gly  
 195 200 205  
 5  
 Ser Ser Arg Asn Glu Glu Thr Pro Ala Ala Pro Thr Pro Ala Gly Ala  
 210 215 220  
 10 Thr Gly Gly Ser Ser Ala Trp Leu Asp Ser Ser Phe Glu Asn Arg Gly  
 225 230 235 240  
 15 Leu Gly Ser Glu Leu Ser Lys Pro Gly Val Leu Ala Ser Gln Val Asp  
 245 250 255  
 20 Ser Pro Phe Ser Gly Cys Phe Glu Asp Leu Ala Ile Ser Ala Ser Thr  
 260 265 270  
 Ser Leu Gly Met Gly Pro Cys His Gly Pro Glu Glu Asn Glu Tyr Lys  
 275 280 285  
 25 Ser Glu Gly Thr Phe Gly Ile His Val Ala Glu Asn Pro Ser Ile Gln  
 290 295 300  
 30 Leu Leu Glu Gly Asn Pro Gly Pro Pro Ala Asp Pro Asp Gly Gly Pro  
 305 310 315 320  
 35 Arg Pro Gln Ala Asp Arg Lys Phe Gln Glu Arg Glu Val Pro Cys His  
 325 330 335  
 Arg  
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 <211> 276  
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 60 Ser Thr Gly Thr Ser Phe Ser Ser Ser Ser Pro Gly Leu Ala Ser Ala  
 20 25 30

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5 Gly Ala Ala Glu Gly Lys Gln Gly Ala Glu Ser Asp Gln Ala Pro Ile  
     35                    40                    45  
 Ile Cys Ser Ser Gly Ala Glu Ala Pro Ala Asn Ser Leu Pro Ser Lys  
     50                    55                    60  
 10 Val Pro Thr Thr Leu Met Pro Val Asn Thr Val Ala Leu Lys Val Pro  
     65                    70                    75                    80  
 15 Ala Asn Pro Ala Ser Val Ser Thr Val Pro Ser Lys Leu Pro Thr Ser  
     85                    90                    95  
 20 Ser Lys Pro Pro Gly Ala Val Pro Asn Ala Leu Thr Asn Pro Ala Pro  
     100                    105                    110  
 25 Ser Lys Leu Pro Ile Asn Ser Thr Arg Ala Gly Met Val Pro Ser Lys  
     115                    120                    125  
 Val Pro Thr Ser Met Val Leu Thr Lys Val Ser Ala Ser Thr Val Pro  
     130                    135                    140  
 30 Thr Asp Gly Ser Ser Arg Asn Glu Glu Thr Pro Ala Ala Pro Thr Pro  
     145                    150                    155                    160  
 35 Ala Gly Ala Thr Gly Gly Ser Ser Ala Trp Leu Asp Ser Ser Phe Glu  
     165                    170                    175  
 40 Asn Arg Gly Leu Gly Ser Glu Leu Ser Lys Pro Gly Val Leu Ala Ser  
     180                    185                    190  
 45 Gln Val Asp Ser Pro Phe Ser Gly Cys Phe Glu Asp Leu Ala Ile Ser  
     195                    200                    205  
 Ala Ser Thr Ser Leu Gly Met Gly Pro Cys His Gly Pro Glu Glu Asn  
     210                    215                    220  
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     225                    230                    235                    240  
 55 Ser Ile Gln Leu Leu Glu Gly Asn Pro Gly Pro Pro Ala Asp Pro Asp  
     245                    250                    255  
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 Pro Cys His Arg

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       <223> Fragment  
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 25                   20                   25                   30  
  
       Gly Lys Gln Gly Ala Glu Ser Asp Gln Ala Pro Ile Ile Cys Ser Ser  
           35                   40                   45  
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       65                   70                   75                   80  
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       Ser Val Ser Thr Val Pro Ser Lys Leu Pro Thr Ser Ser Lys Pro Pro  
           85                   90                   95  
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       Gly Ala Val Pro Asn Ala Leu Thr Asn Pro Ala Pro Ser Lys Leu Pro  
           100                   105                   110  
  
       Ile Asn Ser Thr Arg Ala Gly Met Val Pro Ser Lys Val Pro Thr Ser  
           115                   120                   125  
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       Met Val Leu Thr Lys Val Ser Ala Ser Thr Val Pro Thr Asp Gly Ser  
           130                   135                   140  
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       Ser Arg Asn Glu Glu Thr Pro Ala Ala Pro Thr Pro Ala Gly Ala Thr  
       145                   150                   155                   160  
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       Gly Gly Ser Ser Ala Trp Leu Asp Ser Ser Phe Glu Asn Arg Gly Leu  
           165                   170                   175

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Gly Ser Glu Leu Ser Lys Pro Gly Val Leu Ala Ser Gln Val Asp Ser  
 180 185 190

5 Pro Phe Ser Gly Cys Phe Glu Asp Leu Ala Ile Ser Ala Ser Thr Ser  
 195 200 205

10 Leu Gly Met Gly Pro Cys His Gly Pro Glu Glu Asn Glu Tyr Lys Ser  
 210 215 220

15 Glu Gly Thr Phe Gly Ile His Val Ala Glu Asn Pro Ser Ile Gln Leu  
 225 230 235 240

20 Leu Glu Gly Asn Pro Gly Pro Pro Ala Asp Pro Asp Gly Gly Pro Arg  
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Pro Gln Ala Asp Arg Lys Phe Gln Glu Arg Glu Val Pro Cys His Arg  
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45 Ser Ser Ser Pro Gly Leu Ala Ser Ala Gly Ala Ala Glu Gly Lys Gln  
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50 Gly Ala Glu Ser Asp Gln Ala Pro Ile Ile Cys Ser Ser Gly Ala Glu  
 35 40 45

55 Ala Pro Ala Asn Ser Leu Pro Ser Lys Val Pro Thr Thr Leu Met Pro  
 50 55 60

Val Asn Thr Val Ala Leu Lys Val Pro Ala Asn Pro Ala Ser Val Ser  
 65 70 75 80

60 Thr Val Pro Ser Lys Leu Pro Thr Ser Ser Lys Pro Pro Gly Ala Val  
 85 90 95

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Pro Asn Ala Leu Thr Asn Pro Ala Pro Ser Lys Leu Pro Ile Asn Ser  
 100 105 110

5 Thr Arg Ala Gly Met Val Pro Ser Lys Val Pro Thr Ser Met Val Leu  
 115 120 125

10 Thr Lys Val Ser Ala Ser Thr Val Pro Thr Asp Gly Ser Ser Arg Asn  
 130 135 140

15 Glu Glu Thr Pro Ala Ala Pro Thr Pro Ala Gly Ala Thr Gly Gly Ser  
 145 150 155 160

20 Ser Ala Trp Leu Asp Ser Ser Phe Glu Asn Arg Gly Leu Gly Ser Glu  
 165 170 175

25 Leu Ser Lys Pro Gly Val Leu Ala Ser Gln Val Asp Ser Pro Phe Ser  
 180 185 190

Gly Cys Phe Glu Asp Leu Ala Ile Ser Ala Ser Thr Ser Leu Gly Met  
 195 200 205

30 Gly Pro Cys His Gly Pro Glu Glu Asn Glu Tyr Lys Ser Glu Gly Thr  
 210 215 220

35 Phe Gly Ile His Val Ala Glu Asn Pro Ser Ile Gln Leu Leu Glu Gly  
 225 230 235 240

40 Asn Pro Gly Pro Pro Ala Asp Pro Asp Gly Gly Pro Arg Pro Gln Ala  
 245 250 255

Asp Arg Lys Phe Gln Glu Arg Glu Val Pro Cys His Arg  
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60 <400> 18

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 1 5 10 15

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5 Ser Asn Phe Cys Asn Val Asp Val Val Glu Ile Leu Pro Tyr Leu Pro  
 20 25 30  
 Cys Leu Thr Ala Arg Asp Gln Asp Arg Leu Arg Ala Thr Cys Thr Leu  
 35 40 45  
 10 Ser Gly Asn Arg Asp Thr Leu Trp His Leu Phe Asn Thr Leu Gln Arg  
 50 55 60  
 15 Arg Pro Gly Trp Val Glu Tyr Phe Ile Ala Ala Leu Arg Gly Cys Glu  
 65 70 75 80  
 20 Leu Val Asp Leu Ala Asp Glu Val Ala Ser Val Tyr Glu Ser Tyr Gln  
 85 90 95  
 25 Pro Arg Thr Ser Asp Arg Pro Pro Asp Pro Leu Glu Pro Pro Ser Leu  
 100 105 110  
 Pro Ala Glu Arg Pro Gly Pro Pro Thr Pro Ala Ala Ala His Ser Ile  
 115 120 125  
 30 Pro Tyr Asn Ser Cys Arg Glu Lys Glu Pro Ser Tyr Pro Met Pro Val  
 130 135 140  
 35 Gln Glu Thr Gln Ala Pro Glu Ser Pro Gly Glu Asn Ser Glu Gln Ala  
 145 150 155 160  
 40 Leu Gln Thr Leu Ser Pro Arg Ala Ile Pro Arg Asn Pro Asp Gly Gly  
 165 170 175  
 45 Pro Leu Glu Ser Ser Ser Asp Leu Ala Ala Leu Ser Pro Leu Thr Ser  
 180 185 190  
 Ser Gly His Gln Glu Lys Asp Thr Glu Leu Gly Ser Thr His Thr Ala  
 195 200 205  
 50 Gly Ala Thr Ser Ser Leu Thr Pro Ser Arg Gly Pro Val Ser Pro Ser  
 210 215 220  
 55 Val Ser Phe Gln Pro Leu Ala Arg Ser Thr Pro Arg Ala Ser Arg Leu  
 225 230 235 240  
 60 Pro Gly Pro Thr Gly Ser Val Val Ser Thr Gly Thr Ser Phe Ser Ser  
 245 250 255  
 Ser Ser Pro Gly Leu Ala Ser Ala Gly Ala Ala Glu Gly Lys Gln Gly

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	260	265	270
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15	Val Asn Thr Val Ala Leu Lys Val Pro Ala Asn Pro Ala Ser Val Ser 305 310 315 320		
20	Thr Val Pro Ser Lys Leu Pro Thr Ser Ser Lys Pro Pro Gly Ala Val 325 330 335		
25	Pro Ser Asn Ala Leu Thr Asn Pro Ala Pro Ser Lys Leu Pro Ile Asn 340 345 350		
30	Ser Thr Arg Ala Gly Met Val Pro Ser Lys Val Pro Thr Ser Met Val 355 360 365		
35	Leu Thr Lys Val Ser Ala Ser Thr Val Pro Thr Asp Gly Ser Ser Arg 370 375 380		
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45	Ser Ser Ala Trp Leu Asp Ser Ser Phe Glu Asn Arg Gly Leu Gly Ser 405 410 415		
50	Glu Leu Ser Lys Pro Gly Val Leu Ala Ser Gln Val Asp Ser Pro Phe 420 425 430		
55	Ser Gly Cys Phe Glu Asp Leu Ala Ile Ser Ala Ser Thr Ser Leu Gly 435 440 445		
60	Met Gly Pro Cys His Gly Pro Glu Glu Asn Glu Tyr Lys Ser Glu Gly 450 455 460		
65	Thr Phe Gly Ile His Val Ala Glu Asn Pro Ser Ile Gln Leu Leu Glu 465 470 475 480		
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5 <223> Peptide for immunoization

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